

REMARKS

Applicants request favorable reconsideration and withdrawal of the rejection set forth in the above-noted Office Action in view of the following remarks.

Claims 1, 2, 4, and 5 remain pending, with claims 1 and 4 being independent. The claims have not been amended.

Claims 1, 2, 4, and 5 are rejected in the Office Action under 35 U.S.C. § 103(a) as being unpatentable over Bogoshian (U.S. Patent Application Pub. No. 2005/0135847) in view of Kanesawa et al. (U.S. Patent Application Pub. No. 2003/0180063), Tanaka et al. (U.S. Patent Application Pub. No. 2005/0042534), and Uehara et al. (U.S. Patent Application Pub. No. 2004/0057741).

Applicants respectfully traverse the rejection and submit that the claimed invention is patentably distinguishable from the cited references for at least the following reasons.

The invention set forth in independent claims 1 and 4 is directed to a fixing method and fixing device for fixing a toner image on a recording medium. Specifically, the independent claims set forth relations between a maximum temperature on a recording medium when the recording medium passes through a first fixing unit (T1), a maximum temperature on the recording medium when the recording medium passes through a second fixing unit (T2), a flow starting temperature of the toner (T_{fb}), a minimum temperature on the recording medium during a time period commencing on ejection of the recording medium from the first fixing unit and ending on entry of the recording medium into the second fixing unit (t), and a flow tester softening temperature of the toner (T_s). As described in the disclosure of the application, the

combination of these variables in the claimed relations results in a high quality images, particularly, image with good gloss properties.

One of the specifically claimed relations is that the a minimum temperature on the recording medium during a time period commencing on ejection of the recording medium from the first fixing unit and ending on entry of the recording medium into the second fixing unit (t) is greater than a flow tester softening temperature of the toner (Ts), i.e., $t > Ts$. If $t < Ts$, it has been found that it is difficult to perform sufficient dissolution of the toner when the recording medium passes through a second fixing unit, and thus, the toner is not sufficiently softened. See paragraph 0035 of the specification. As a result, smoothness of the toner surface is degraded, and there is poor gloss uniformity. Compare, e.g., example 23 and comparative example 3 set forth in Table 4 in the specification of the application.

Applicants submit that the combination of Bogoshian, Kanesawa et al., Tanaka et al., and Uehara et al. fails to disclose or suggest the combination of features of the claimed invention, and in particular, the specifically claimed relations. None of these references teaches the claimed relationship, and indeed, the Office Action only concludes the relationships are present after combining features scattered over the four references. See page 7 of the Office Action. As explained below, Applicants respectfully submit that the rejection does not flow from the teachings of the references and the knowledge of one of ordinary skill in the art, but rather only considers the claimed features in isolation, and relies on selected elements from the references, while not accounting for other parts of the references that teach away from the combination.

Bogoshian is cited in the Office Action as disclosing features of the invention. The Office Action acknowledges that the reference does not disclose all of the claimed features, including the variable “t” (i.e., minimum temperature on the recording medium during a time

period commencing on ejection of the recording medium from the first fixing unit and ending on entry of the recording medium into the second fixing unit).

Applicants agree that Bogoshian does not disclose or suggest the variable t . Applicants further assert that the configuration of the Bogoshian would dissuade one of ordinary skill in the art from controlling this variable in any particular manner, or more specifically, as in the claimed invention. Bogoshian discloses that the temperature of the primary (first) fusing device 10 should be kept to a minimum to prolong the life of the device. Paragraph 0054. Further, the reference teaches the use of decurler device prior to being subjected to the secondary fusing device (100). See paragraphs 0041-0046. Thus, the reference teaches a lowered temperature for initially heating the recording medium in the primary fusing device, and then subjecting the recording medium to intermediary (decurling) processing prior to the secondary fusing process. Both of these ideas run counter to the idea of maintaining an elevated temperature on the recording medium during a time period commencing on ejection of the recording medium from a first fixing unit and ending on entry of the recording medium into a second fixing unit (t), such as a temperature above a flow tester softening temperature (T_s) of the toner. In other words, the reference teaches away from at least one of the claimed relations by indicating that the recording medium should be heated to low levels and subjected to intermediary processing that would necessarily result in the temperature of the recording medium being further reduced.

The secondary citation to Kanesawa et al. is also not suggestive of the claimed combination of relations, and in fact, teaches away from at least one of the relations in a manner analogous to Bogoshian. Kanesawa et al. is cited in the Office Action as disclosing a first belt-nip fixing unit and a second heat-pressure fixing unit. While this may be true, the reference discloses that the secondary fixing unit is part of a separate structure 50 that is independent of the

main structure 1 housing the first belt-nip fixing unit. See Fig. 1, paragraphs 0066-0067. It is readily apparent that a recording medium passing from the belt-nip fixing unit in the main structure 1 to the separate structure 50 housing the secondary fixing unit would decrease in temperature. Indeed, it would appear to be extremely difficult to predict or maintain any sort of temperature as the recording medium physically travels outside of the main structure 1 to the secondary structure 50. See Fig. 1. Thus, like Bogoshian, Kanesawa et al. appears to counsel against the idea of maintaining temperature on the recording medium at an elevated temperature during a time period commencing on ejection of the recording medium from a first fixing unit and ending on entry of the recording medium into a second fixing unit (t), such as a temperature above a flow tester softening temperature (Ts) of the toner.

The Office Action cites Uehara et al. for suggesting the variable t as in the claimed invention, finding that it would have been obvious to one of ordinary skill in the art to modify the disclosure of Bogoshian in order to ensure that the toner holds is softening state so that it can be further treated without the application of high pressure that can cause deformation.

Applicants respectfully submit, however, that the Office Action's reasoning of this combination of Bogoshian and Uehara et al. looks at a particular feature in isolation, namely the variable t, and ignores the teaching in both references that go against the combination. Note that references must be considered in their entirety, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540 (Fed. Cir. 1983); MPEP § 2141.03(VI). As discussed above, Bogoshian suggests that the temperature of the primary fusing device should be kept at a minimum. This in turn suggests that the temperature of the recording medium exiting from the first fusing device until entering the second fusing process (i.e., t) will be low, and thereby runs contrary to any suggestion of raising

the temperature to the softening state contained in Uehara et al. Moreover, Bogoshian discloses a decurling process between the first and second fusing process, thereby again tending against maintaining the recording medium at an elevated temperature state, regardless of the teachings of Uehara et al.

Still further, a close reading of Uehara et al. reveals that the elevated temperature of the recording medium to a toner softening state is actually done in combination with lowering the temperature of the secondary fusing device. Specifically, Uehara et al. teaches that while the temperature of the recording medium is at an elevated state when entering the gloss control unit (i.e., the second fixing unit), the temperature of the gloss control roll is lowered so that the recording medium may be peeled from the roll. See paragraphs 0138-0143. That is, the elevated temperature of the recording medium and the lowered temperature of the gloss control roll go hand-in-hand. Assuming, arguedo, that one of ordinary skill in the art looked to modify Bogoshian with the teaching of an elevated temperature for the recording medium of Uehara et al., the skilled artisan would presumably apply the corresponding lowered temperature of the second fixing unit to the teaching of Bogoshian. Yet, under such a combination, the claimed invention would not be met, as one of the specifically claimed relations is that maximum temperature on the recording medium when the recording medium passes through a second fixing unit (T2), is greater than a minimum temperature on the recording medium during a time period commencing on ejection of the recording medium from the first fixing unit and ending on entry of the recording medium into the second fixing unit (t), and a flow tester softening temperature of the toner (Ts). That is, $T2 > t > Ts$ would not be met when combining Bogoshian with Uehara et al.

Applicants still further submit that the citation to Tanaka et al. fails to suggest the

combination of features of the invention, or otherwise make up for the features not suggested by the other references. Tanaka et al. is cited in the Office Action as disclosing toners which the Office Action asserts would lead one of ordinary skill in the art to adjust the heating structure of Bogoshian “downward.” Office Action, pp. 5-6. Applicants submit, however, that this reasoning further reinforces the fact that the claimed invention would not have been obvious in view of the combination of references. Decreasing the temperature applied by the primary (first) fusing device of Bogoshian, goes directly against heating the recording medium to an elevated state, such as in the claimed feature of a minimum temperature on the recording medium during a time period commencing on ejection of the recording medium from the first fixing unit and ending on entry of the recording medium into the second fixing unit is greater than a flow tester softening temperature of the toner.

In sum, Applicants respectfully submit that the claimed combination of features, and in particular, the claimed relations would not have been obvious to one of ordinary skill in the art in view of the references cited in the Office Action. The rejection only looks features of the claimed invention individually, and thus does not consider the claimed invention as a whole. Further, the rejection fails to consider the cited references in their entirety, and the effect of modifying one particular feature from the reference with the other features of the reference. Nor does the rejection consider portions of the references that teach away from each other and the combination. Accordingly, Applicants submit that the Section 103 rejection should be withdrawn.

Applicants further submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejection set forth in the Office Action, and a Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. Office by telephone at (202) 530-1010. All correspondence should continue to be directed to our address listed below.

Respectfully submitted,

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